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The presence of the Patagonian seahorse *Hippocampus patagonicus* Piacentino & Luzzatto, 2004 (Teleostei: Syngnatidae) in Monte Hermoso, southwestern Buenos Aires province, Argentina

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Abstract: Based on data gathered during interviews with local artisanal fishermen and seahorses collected by them, *Hippocampus patagonicus* Piacentino & Luzzatto 2004 was found to occur in coastal waters of Monte Hermoso, southwestern Buenos Aires province, Argentina. High catches spanning several years and the identification of specimens confirm the presence of *H. patagonicus* in Monte Hermoso.

Key words: distribution; fish; Gasterosteiformes; record; Southwestern Atlantic Ocean

Seahorses (genus *Hippocampus* Rafinesque, 1810) are often difficult to detect in their natural habitats due to their effective camouflage. They can remain virtually immobile for a long time and change their coloration pattern. Some have long skin filaments or encrusting organisms on their skin enabling them to blend in with their environment (Foster & Vincent 2004). In addition, they can present a patchy distribution and occur at low densities, which further complicates their localization in poorly explored areas. In these cases, local knowledge, particularly that of fishermen, can help to detect populations, establish their areas of occurrence, and make conservation inferences (Rosa et al. 2005).

The Patagonian seahorse *Hippocampus patagonicus* Piacentino & Luzzatto, 2004 occurs in the Southwest Atlantic Ocean from Rio do Janeiro, Brazil, to Puerto Madryn, Argentina (Rosa et al. 2011; Luzzatto et al. 2012, 2014; Silveira et al. 2014; Pereira et al. 2016; Figure 1). In Argentina, there are currently only two populations recorded, one in San Antonio Bay, the type locality of the species, and the other at Mar del Plata dock (Piacentino & Luzzatto 2004; Luzzatto et al. 2012). Although sporadic

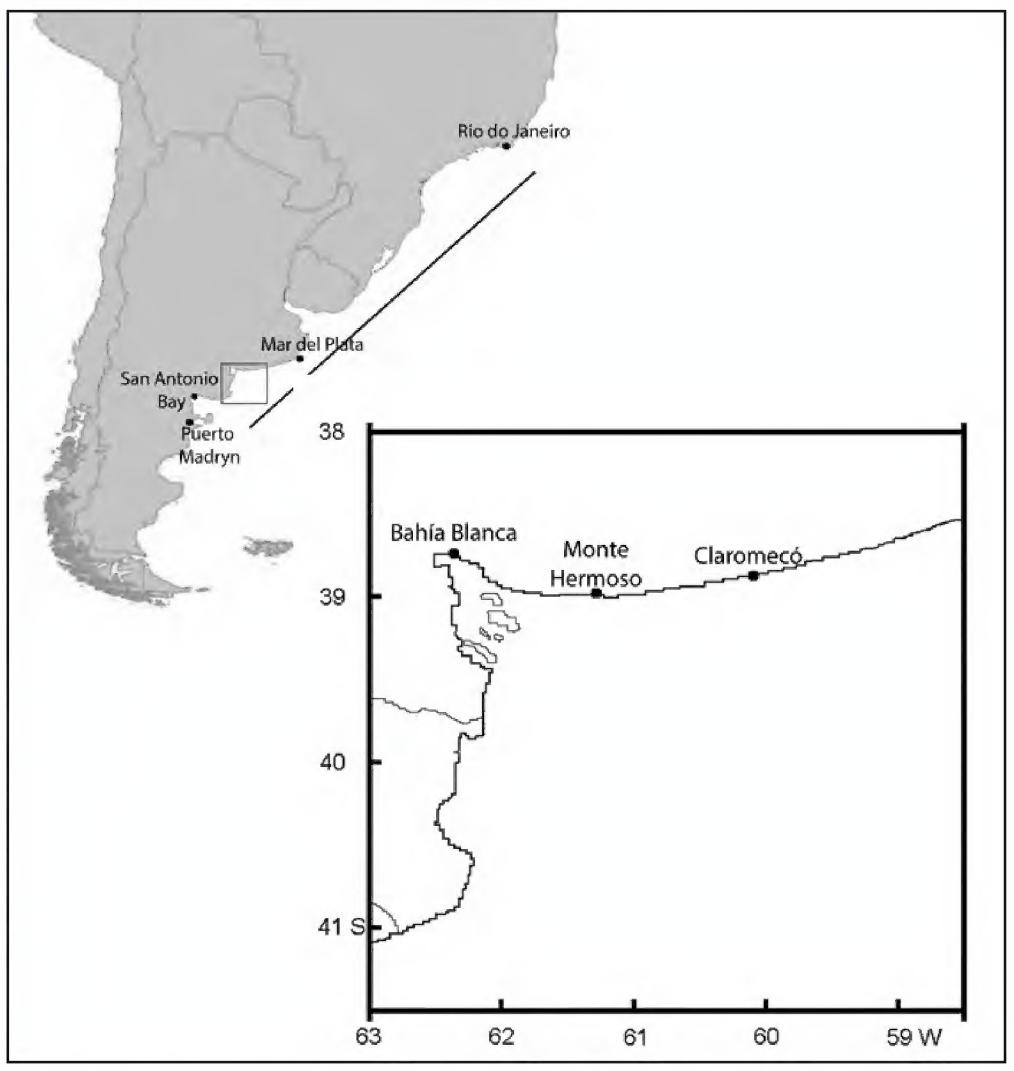

Figure 1. Distribution of *Hippocampus patagonicus* (Rio do Janeiro to Puerto Madryn) indicated by a black line. Mar del Plata and San Antonio bay are the locations of the two previously known Argentine populations of *H. patagonicus*. Right: enlargement of the area known as El Rincón and location of the study area.

records have been reported in the area between these two localities, no other population has been detected so far (Luzzatto et al. 2014). The aim of this study was to document the presence of *H. patagonicus* in the coastal area of Monte Hermoso, southwestern Buenos Aires province.

Monte Hermoso is a beach resort located at 38°59′33″ S, 061°15′55″ W (Figure 1). It has a mesotidal regime with

Figure 2. Dry individuals of *Hippocampus patagonicus* collected in Monte Hermoso, Buenos Aires province, Argentina, and deposited in the Syngnathidae collection of the Museo Municipal de Ciencias Naturales "Lorenzo Scaglia" (MMPEAA). Sex and total height of specimens: S/32, female, 78 mm; S/33, female, 70 mm; S/34, male, 65 mm; S/35, male, 76 mm. Scale bar = 50 mm.

semidiurnal tides with a mean amplitude of 2.5 m. Seawater temperature varies from 22.9 °C in January to 6.4 °C in July (Delgado 2013).

Local artisanal fishermen were interviewed to gather information about the presence of seahorses in the area. Items recorded at the interviews were location of seahorses, frequency of catches, fishing gear employed, number of seahorses caught per fishing trip, and the intended use of the seahorses caught.

According to the information obtained in interviews, seahorses were regularly caught by gillnets used to target at Narrow Smoothhound Shark *Mustelus schmitti* S. Springer, 1939. Gillnets have been used during October to December and March to April during recent years. Between 10 and 50 nets were used in each fishing trip. Nets were 1.7–2.2 m high and 50 m long and had a mesh size of 90–120 mm.

The number of seahorses caught per fishing trip varied according to fishing site and fisher. The fishermen reported catching from one to 32 individuals, with a mean value of 17 at a site indicated as a hot spot. Seahorses were found holding to the net at about 30 cm from the bottom. They were caught between 18 and 12 m depth at 6–15 km from the coast line. The fishermen stated that seahorses were either released or retained for themselves or to give as presents.

The fishermen also provided a sample of 24 seahorses, 20 of them dried and the rest alive. Live seahorses were held in aquaria at the Museo Municipal de Ciencias Naturales "Vicente Di Martino" for two or three months until they died. They were collected during October 2009– 2015 and March 2012– 2013. Dried seahorses were collected during February 2010 and November 2013– 2014. The specimens were measured and sexed. The coloration of the individuals was also recorded.

A subsample of four dried seahorses (collected November 2013 and 2014) was deposited in the collection of Syngnathidae of the Museo Municipal de Ciencias Naturales "Lorenzo Scaglia". Specimens were identified by D.C. Luzzatto and M.C. Estalles. Morphological characters, counts and measurements were taken following Lourie et al. (2004) and Piacentino and Luzzatto (2004). Measurements were taken to the nearest millimeter using calipers.

The specimens presented the morphological diagnostic characteristics of *H. patagonicus* (Figure 2). Specimens presented 11 trunk rings and 37–38 tail rings (Piacentino & Luzzatto 2004; Silveira et al. 2014; Pereira et al. 2016).

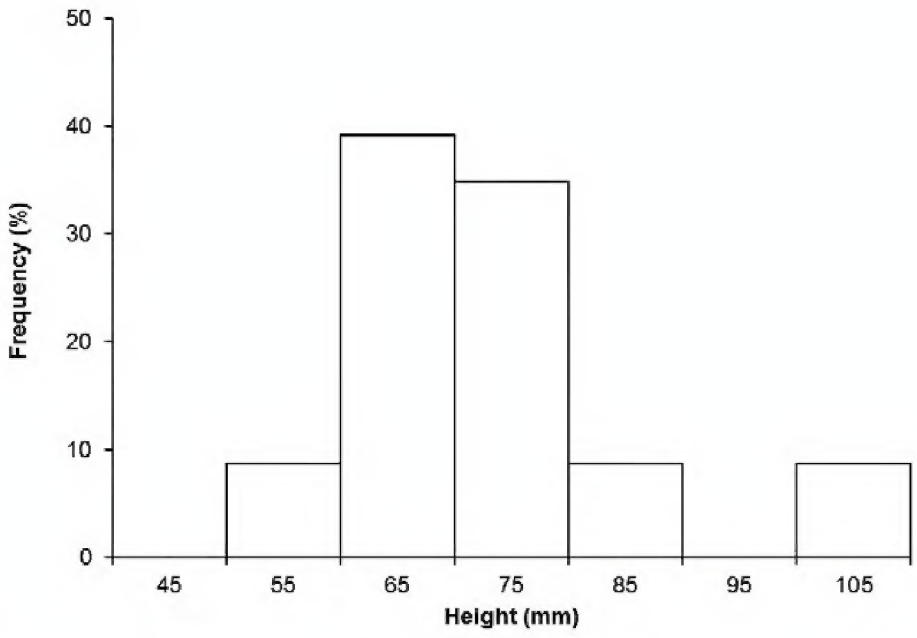

Figure 3. Size frequency distribution of the individuals of *Hippocampus patagonicus* sampled (n = 24).

However, differences were observed, particularly, in head length and snout length (Table 1). These differences may be because all the measurements were performed on dry material to avoid damaging the sample in the present study.

Most *H. patagonicus* sampled were yellow (63%; n = 15), and the rest were light brown. Males accounted for 75% (n = 18) of the sample and ranged from 54–100 mm while females varied from 49.6–78 mm. Males did not show signs of being pregnant. Each of them exhibited a flattened broad pouch. The size frequency distribution showed most of individuals in the range of 65–75 mm (Figure 3).

The southern distribution of *H. patagonicus* until now is Puerto Madryn, northern Patagonia, Argentina (Piacentino & Luzzatto 2004). Although Piacentino (2008) expanded its geographical range south to Puerto Deseado in south Patagonia, no individuals from these localities have been collected or photographed. In addition, there are neither records in museum collections nor any indication for the basis for the southern range stated by Piacentino (2008). The presence of this species south of Puerto Madryn should be considered uncertain (Luzzatto et al. 2012).

Isolated individuals of *H. patagonicus* have been collected along the coast of Buenos Aires province (Luzzatto et al. 2012, 2014). However, in the area of Monte Hermoso, the species has been found continually over the years, and the high catches reported by local fishermen suggest the presence of a stable population. Although there are no official records, fishermen have delivered seahorses to the local museum several times over the last 30 years (Di Martino pers. com.). The maximum number of individuals delivered by a fisherman was 12, and once, a pregnant male gave birth at the aquarium of the museum (Di Martino pers. com.).

The coastal area of Monte Hermoso is located in a complex ecological and oceanographic system known as "El Rincón" (Acha et al. 2012). The high productivity of the region and the presence of an overturning circulation cell provide a favorable habitat for the reproduction of fishes (Acha et al. 2012; Delgado 2013). During spring and summer, seawater temperature is higher than in other northern localities, which may allow the reproduction of *H. patagonicus* as well as growth and settlement of planktonic juveniles (Luzzatto et al. 2013).

Whereas the two populations of *H. patagonicus* in Argentina are located in the sheltered environments of San Antonio Bay and the port of Mar del Plata (Luzzatto et al. 2012), this population is from in an exposed environment, uniquely for Argentina.

Unlike records of other locations where populations of *H. patagonicus* are found, fishermen in Monte Hermoso did not report selling the individuals they captured. This information is in agreement with another study, conducted in previous years in the same area, which did not detect the trade of *H. patagonicus* (Estalles et al. unpublished data).

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Table 1. Comparison of meristic and morphometric (mm) data of *Hippocampus patagonicus* provided by Piacentino & Luzzatto (2004), Silveira et al. (2014), Pujol (2014), Pereira et al. (2016) and the specimens deposited in the Syngnathidae collection of the Museo Municipal de Ciencias Naturales "Lorenzo Scaglia". *N* = number of specimens studied, Ht range = height range recorded, HL/SnL = head length vs. snout length, TrR = trunk rings and TaR = tail rings.

Reference	*N*	Ht range	HL/SnL	TrR	TaR
Piacentino & Luzzatto (2004)	22	21–103	2.43–3.47	11	37–41
Silverira et al. (2014)	59	32–144	2.85–3.9	11	34–37
Pujol (2014)	14	65–134	2.33–2.56	11	34–38
Pereira et al. (2016)	6	97–123	2.81–3.91	11	35–38
Present study	4	65–78	3.33–4.5	11	37–38

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